

**COMMONWEALTH OF AUSTRALIA**  
**PATENT SPECIFICATION**

**210562**

12, 052/55.

Complete Specification Lodged ..... 8th September, 1955.

Application Lodged (No. 12, 052/55) ..... 8th September, 1955.

Applicant. . . . (Actual Inventor) . . . . . Louis Polo

Convention Application.  
(Switzerland, 8th October, 1954).

LAPSED BEFORE ACCEPTANCE.

Complete Specification Published ..... 8th March, 1956.

Classification 25.9.

Drawing attached.

**COMPLETE SPECIFICATION.**

**"IMPROVEMENTS IN OR RELATING TO VACUUM CLEANERS."**

The following statement is a full description of this invention, including the best method of performing it known to me:

The vacuum cleaners known hitherto comprise, principally, a motor, a screw designed to set the air in motion and a filter bag the purpose of which is to retain the dust from the air current passing through it.

It is quite obvious that great difficulties are encountered in the realization of such an arrangement owing to the fact that the better the bag retains the dust, the less it allows the air to pass through it. Thus all vacuum cleaners are a compromise between the power limits imposed on the motor and the filtering conditions still permissible for the bag. As the latter allows the finest particles of dust to pass through, traces of them are found not only in the motor, which is harmed by this dust, but also in the air escaping from the apparatus, which air is laden with the particles and returns them to the surrounding atmosphere. As evidence of this we would mention only the fine flourlike layer which is particularly visible on polished wood after each cleaning with the vacuum cleaner.

The bag and the relatively powerful motor of such vacuum cleaners, moreover, render them bulky.

The vacuum cleaner according to the present invention remedies these drawbacks in that at least part of an air current passing through the apparatus and containing at least the finest particles of dust is conveyed at a given moment through deflecting means which are arranged in a material capable of retaining moisture and designed to fix the dust in the manner of certain mucous membranes of the human body.

A spongy, vegetable or synthetic material will be chosen for this purpose, by way of example the so-called vegetable sponge or other kinds of sponge used primarily in the household or else for washing the bodywork of automobiles. The more the said material retains moisture, a long time during the better qualified it is to fulfil the purpose just mentioned.

The annexed drawing illustrates two embodiments of the invention, given by way of example.

Fig. 1 is a general view of the vacuum cleaner according to the first embodiment, shown in perspective, without a bag and with portions broken off.

Fig. 2 shows that part of the said vacuum cleaner which contains the suction rotor and an auxiliary motor cooling rotor.

Fig. 3 is a partial view of a shell of the vacuum cleaner body.

Fig. 4 is a cross-section through the element for extracting dust from the air.

Fig. 5, finally, shows in perspective, with portions broken off, that member of the said element which is capable of retaining moisture.

Fig. 6 is a longitudinal section of the second embodiment, comprising a bag.

The vacuum cleaner according to Fig. 1 comprises a body of generally cylindrical shape, formed by two shells 1 and 2 which have a wider portion 3 respectively 4 located approximately one third of the distance along the said body.

In this wider portion the following are arranged coaxially and on a motor shaft common to the revolving parts: a suction rotor with centrifugal action 5, a disk 6 (partially broken off) forming a dividing wall, a rotor 7 for circulating cooling air for the motor, the said rotor also having a centrifugal action and being visible only in Fig. 2.

The suction rotor 5 faces the mouthpiece 8 forming the first third of the apparatus' length and the air circulation rotor 7 faces the part shaped like a handle which forms the other two thirds of the apparatus and contains the electric motor 9 which is partly supported by the disk 10 per-

forated with holes 11.

The position of the disk 6, like that of the disk 10, is determined in the body 1-2 by internal circular ribs 12 and 13 of the shells (see Figs 1 and 3).

The motor 9 is supplied with electric power by the flex 14 which enters the apparatus through the opening at the opposite end from the mouthpiece 8.

The circuit-breaker may be located on the flex outside the apparatus or form a part of the latter. It has not been illustrated to avoid overloading the drawing unnecessarily.

The shaft common to the motor 9 and the two rotors 5 and 7 is found at 15; it merges into the shaft of the whole apparatus.

The two shells 1 and 2 have slots in their wider portion, two slots 16 for the shell 2 being located in the plane of the suction rotor and one lateral slot 17 for the shell 1 located in the plane of the cooling air rotor 7 (see Figs. 1 and 2, and 2 and 3 respectively).

Thus, the air sucked in by these two rotors, either through the mouth piece 8, or through the motor 9, and the holes 11 is expelled radially through the slots 16 on the one hand, and through the slot 17 on the other.

As this air emerging through the opening 17 has become heated by contact with the motor, it should be noted that it forms a warm current enabling the apparatus to be used, additionally, to dry the hair for instance.

The other current, laden, as will be seen, with the dust which the apparatus is designed to absorb, passes on the other hand through deflecting means in the form of holes 18 and 19, as well as through an intermediate chamber 20, foreseen in a piece of vegetable or synthetic sponge 21 which is held facing the slots 16 by a metal frame 22 (see its position in Fig. 2).

Deflection occurs owing to the fact that the holes 18 and 19, either by their number or by their arrangement or by their number and arrangement are disposed so as not to be opposite each other, with the result that the air can not pass through this element of the apparatus without changing direction in the chamber 20, that is, by eddying there.

The sponge is preferably soaked in water beforehand, then wrung out just sufficiently to prevent a surplus of water dripping from it. It should be made of a material capable of retaining the most moisture possible.

Fig. 5 shows this sponge in perspective and illustrates how its profile can be kept invariable by means of a brace 23 made of a wire bent

in a suitable manner.

The apparatus described in the foregoing operates as follows:

The mouth piece 8, which is equipped with small brushes 24 for the purpose, is passed over the objects to be cleaned. In view of the reduced dimensions of the apparatus, it is thus possible to brush various ornamental moundings, knick-knacks and small objects which one does not want to be constantly moving, furniture, particularly parts of the latter difficult of access, furs, fabrics, clothes, and to such in the detached dust caught up by the air driven by the rotor 5.

This air, expelled through the openings 16, passes through the deflecting means in the damp sponge 20. Both in the holes 18 and 19 and in the chamber 20 the dust suspended in this air settles and sticks to the sponge. Once the latter is laden with dust, it need merely be washed and soaked again in clean water so that the operation can be repeated.

It could also be impregnated with a disinfectant, deodorant or even a perfume for instance.

In view of the fact that the apparatus does not develop great power, it is suitable for the cleaning of furs, the hairs of which are pulled out by too powerful vacuum cleaners. The apparatus thus forms an excellent and practical clothes brush and is very handy to use for its weight can be reduced to about 500 gm. Also it consumes very little power.

It is to be noted that the brushes 24 do not all have the same length, but that long ones alternate with short ones. This crenellated arrangement has the advantage of allowing a current of air, need to carry along the dust, to pass between the free ends of the said brushes.

It is obvious that this dust absorbing process could not be applied in its entirety to large vacuum cleaners, but on the other hand it is suitable for the better retention of flour-fine dust which has not yet been mastered by any brush or vacuum cleaner since it even passes through vacuum cleaner bags which then return it to the surrounding air.

To remedy this latter drawback a special application of the present invention has been envisaged for large vacuum cleaners.

In this case, and without dispensing with the bag designed to retain coarse dust and refuse, at least one moist sponge is attached to the vacuum cleaner, the air already pre-filtered by the bag being passed through the deflecting means in the said sponge so as to deposit their all that has not been retained by the bag.

The suggestion has already been made to fit vacuum cleaners with filters located behind the bag so as to protect the motor from fine dust. These filters, however, apart from the fact that they act in exactly the same way as the bag, but in a finer degree, check the flow of air con-

siderably and thus cause a drop in pressure which renders the suction ineffective.

In the case of the present invention there is never any filtering; there are, however, open deflecting means which offer virtually no resistance to the passage of air.

Thus, the apparatus described and illustrated only requires a low-powered motor, while the addition of an absorbant, moist element to a large vacuum cleaner will in no way reduce its effectiveness.

It is moreover possible to construct relatively small vacuum cleaners with a bag, as is shown by the second embodiment in Fig. 6 which is merely a modification of the first embodiment just described.

Here, too, there are two shells 25 and 26 containing the motor 27 together with the suction rotor 28 and the air circulation rotor 29, as well as the housing 30 for the damp sponge through which the air sucked in through the mouthpiece 31 is blown. Here, however, the air, instead of passing directly from the mouthpiece through the rotor 28 to the sponge - which, though not illustrated, is arranged at 30 - , first passes through a filter bag 32.

The purpose of this bag is to retain coarse dust and its mesh can therefore even be larger than that of conventional vacuum cleaner bags. It would even be possible to use wire netting.

Once the air has passed through the bag, it will deposit the remaining dust, i. e. the fine particles, in the sponge:

As the latter does not act as a filter, it provides no additional resistance to that offered by the bag 32. On the contrary, the result will be an air which is perfectly clean owing, firstly, to the fact that it is filtered by the bag and, secondly, to the fact that all the fine particles of dust are retained in the damp sponge.

As the bag 32 here opens directly into the mouthpiece 31, a tube 33 is provided which penetrates into the bag so as to prevent the dust falling back into the mouthpiece. A valve made of little strips of fabric or leather might also be provided.

Finally a sleeve 34 is envisaged which can be screwed onto the body of the vacuum cleaner, on the outside of which is arranged the circuit - breaker 35 for the motor 27.

It is obvious that as the embodiment described and illustrated is only given by way of example, the invention may be realized in many ways without departing from its framework.

The claims defining the invention are as follows:-

1. A vacuum cleaner, characterized by the fact that at least part of a current of air passing through it and containing at least the fin-

est particles of dust is conveyed at a given moment through deflecting means arranged in a material capable of retaining moisture and designed to fix the dust in the manner of certain mucous membranes of the human body. (8th October, 1954).

2. A vacuum cleaner according to Claim 1, characterized by the fact that the moisture retaining material is spongy and capable of being soaked with water. (8th October, 1954).

3. A vacuum cleaner according to Claims 1 and 2, characterized by the fact that the said material is of the so-called vegetable sponge type. (8th October, 1954).

4. A vacuum cleaner according to Claim 1, characterized by a block of spongy material having holes for the passage of dustladen air, one series of holes opening out into a chamber from which the air escapes through another series of holes, the holes of the two series not being opposite one another. (8th October, 1954).

5. A vacuum cleaner according to Claim 1, characterized by a body end of which is formed by a suction mouthpiece, in the axis of which there is a rotor that sucks in air and then projects it radially out of the body through lateral slots leading to the deflecting means through which the air escapes. (8th October, 1954).

6. A vacuum cleaner according to Claims 1 and 5, characterized by a dividing wall arranged behind the rotor and behind which there is an electric motor. (8th October, 1954).

7. A vacuum cleaner according to Claims 1, 5 and 6, characterized by the fact that the motor, the suction rotor and another rotor are coaxial, the latter sucking the air through the motor and its housing and expelling it radially through a slot in the body of the apparatus. (8th October, 1954).

8. A vacuum cleaner according to Claim 1 and 5, characterized by the fact that the mouthpiece is at least partially surrounded by brushes. (8th October, 1954).

9. A vacuum cleaner according to Claims 1, 5 and 8, characterized by the fact that the brushes are of two different lengths, long ones al-

ternating with short ones. (8th October, 1954).

10. A vacuum cleaner according to Claims 1 and 4, characterized by the fact that the block of spongy material is U-shaped and the chamber is formed by the space between the arms of the said U, which arms are pierced with holes. (8th October, 1954).

11. A vacuum cleaner according to Claims 1, 4 and 10, characterized by a brace consisting of iron wires, which brace keeps the arms of the U in place. (8th October, 1954).

12. A vacuum cleaner according to Claims 1 and 4, characterized by the fact that the block of spongy material is held in position by a frame covering part of the said cleaner's body. (8th October, 1954).

13. A vacuum cleaner according to Claim 1, characterized by the fact that the air blown through the deflecting means first passes through a bag designed to retain the coarsest particles. (8th October, 1954).

14. A vacuum cleaner substantially as hereinbefore described and illustrated in Figs. 1, 2, 5 of the annexed drawings. (8th October, 1954).

15. A vacuum cleaner substantially as hereinbefore described and illustrated in Fig. 6 of the annexed drawings. (8th October, 1954).

MARK J. CALLINAN.

Patent Attorney for Applicant.

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References: Nil.

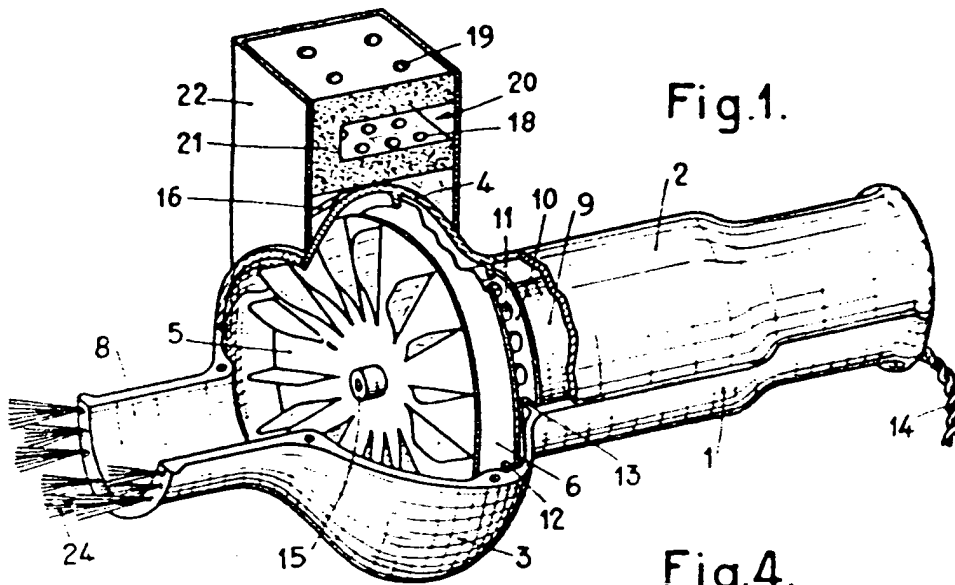


Fig. 1.

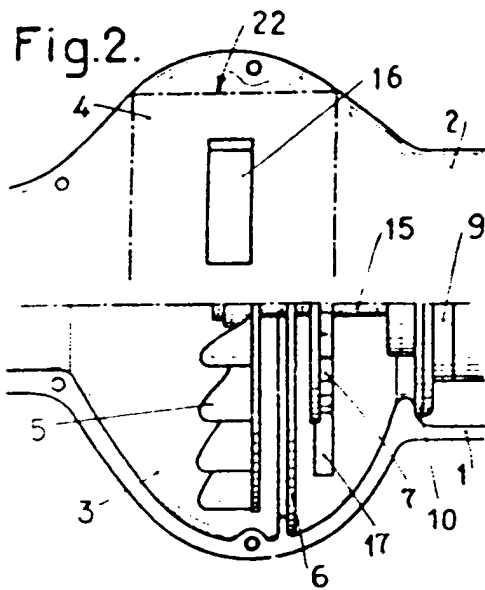


Fig. 2.

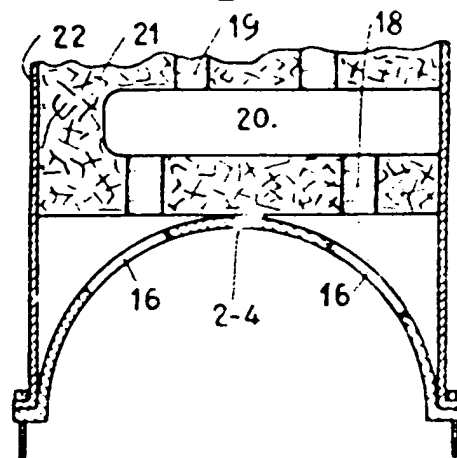


Fig. 4.

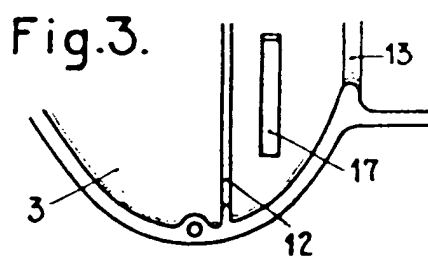


Fig. 3.

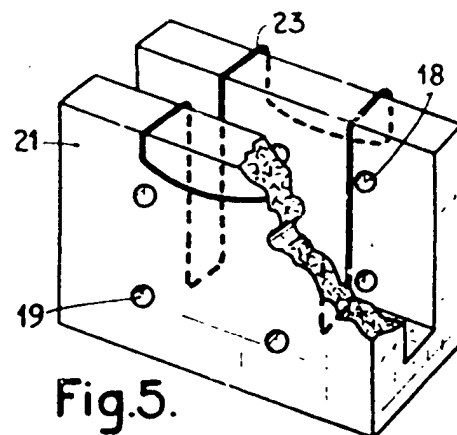


Fig. 5.



